CLAIMS

1. A method for promoting tissue regeneration on wound surfaces (1), in particular on wound surfaces which are to intergrow with other wound surfaces or with an implant, or are to heal into a tissue surface, characterized in that mechanical oscillation is coupled into the wound surface (1) with the help of a treatment instrument (2) or an implant (5).

2. The method according to claim 1, characterized in that the mechanical oscillation is ultrasonic oscillation having a frequency of 1 to 200 kHz.

3. The method according to claim 1 or 2, characterized in that a contact surface of the treatment instrument (2) is brought into contact with the wound surface (1) and mechanical oscillation is applied to the treatment instrument, wherein the treatment instrument (2) is moved or is stationery in relation to the wound surface during treatment.

4. The method according to claim 1 or 2, characterized in that a contact surface of the implant (5) is brought into contact with the wound surface (1) and mechanical oscillation is allied to the implant (5) during an implanting movement relative to the wound surface (1) and/or after the implanting movement when the implant is in its implanted condition.

5. The method according to claim 4, characterized in that the implant (5) comprises self-cutting or furrowing structures and that it is positioned in the tissue with the help of mechanical oscillation.

6. The method according to claim 4, characterized in that the implant (5) is positioned in an opening of the tissue and is then set into oscillation.

7. The method according to one of claims 3 to 6, characterized in that the contact between the treating surface of the treatment instrument (2) or of the implant (5) and the wound surface (1) to be treated is a direct contact.

8. The method according to one of claims 3 to 6, characterized in that a liquid, gel-like or solid coupling medium is applied between the treatment instrument (2) or the implant (5) and the wound surface (1) to be treated.

9. The method according to claim 8, characterized in that chemo-therapeutically effective substances are added to the coupling medium.

10. The method according to one of claims 1 to 9, characterized in that the wound surface (1) is a bone tissue surface.

11. The method according to one of claims 4 to 10, characterized in that the implant (5) is a dental implant which is positioned in an opening of a jawbone.

12. A device for promoting tissue regeneration on wound surfaces (1), in particular on wound surfaces which are to intergrow with other wound surfaces or with an implant, or are to heal into a tissue surface, wherein mechanical oscillation is coupled into the wound surface, characterized in that the device comprises an oscillation drive and a treatment instrument (2) which is designed for being oscillated by the oscillation drive, or coupling means for coupling such a treatment instrument (2) or implant (5) to the device.

13. The device according to claim 12, characterized in that the means for coupling an implant (5) is a smooth coupling surface which is positionable on a proximal surface of the implant (5).

14. The device according to any one of claims 12 to 13, characterized in that it further comprises an amplitude-transforming and/or direction-transforming element (20), wherein the treatment instrument or the coupling means are arranged on said element.

15. The device according to claim 14, characterized in that the amplitude-transforming and/or direction-transforming element (20) comprises a plurality of coupling locations in which it can selectively be coupled to the oscillation drive.

16. The device according to claim 14 or 15, characterized in that the amplitude-transforming and/or direction-transforming element (20) has the shape of a beam, a ring or a hollow body.

17. The device according to claim 16, characterized in that the treatment instrument (2) is fastened to an outside surface of the amplitude-transforming and/or direction-transforming element (20).

18. The device according to claim 16, characterized in that the amplitude-transforming and/or direction-transforming element (20) is annular or has the shape of hollow-body and that the treatment instrument (2) is fastened to an inner surface of the amplitude-transforming and/or direction-transforming element (20) and projects from the element (20) through an opposite opening (35).

19. A treatment instrument (2) or implant (5) for carrying out the method according to any one of claims 1 to 11, characterized in that the instrument or implant is designed as an oscillation body, that its proximal end comprises means for a fixed or releasable coupling or is connected or integrally formed to an amplitude-transforming and/or direction-transforming element (20) or comprises a proximal contact surface designed for oscillation coupling, and that the instrument or implant comprises in the region of a distal end contact surfaces (15) for contacting the wound surface, said contact surfaces being provided with energy directors (16).

20. The treatment instrument or implant according to claim 19, characterized in that the energy directors (16) have the shape of tips or edges projecting from the contact surface (15).

21. The treatment instrument or implant according to any one of the claims 19 or 20, characterized in that the energy directors (16) protrude from the contact surface by at least 50 µm.

22. The treatment instrument or implant according to any one of the claims 19 to 21, characterized in that the energy directors (16) are no further apart than 6 to 10 mm.

23. The treatment instrument or implant according to any one of the claims 20 to 22, characterized in that the energy directors (16) have the shape of edges (11) running in a spiral or axial manner and designed to furrow the wound surface on positioning the instrument or implant.

24. The treatment instrument or implant according to claim 23, characterized in that it comprises a distal tip (40) and joined on the tip (40), a plurality of essentially cylindrical or conical regions (41) with diameters getting larger with an increasing distance to the tip (40), wherein the tip (40) and the cylindrical or conical regions (41) are provided with axially running, furrowing edges (11), and wherein steps between the cylindrical or conical regions (41) are likewise configured as furrowing edges (42).

25. The treatment instrument or implant according to claim 23, characterized in that it is essentially conic and at least partially comprises axially extending edges and edges extending around at least a part of an instrument or implant circumference.

26. The treatment instrument or implant according to claim 25, characterized in that the edges extending around at least a part of the instrument or implant circumference are at least partially undercut.

27. The treatment instrument or implant according to claim 25, characterized in that the edges extending around at least a part of the instrument or implant circumference comprise at least partially a clearance angle.